

## System Control Center OIL/PCB Discharge Report

Portland General Electric

### Report for System Dispatchers' Oil/PCB Discharge

Revised: No  
Reported by: JERRY THOMAS  
Incident Date: 9-21-2011  
Incident Time: 900  
Submission Date: 9-21-2011  
Submission Time: 907  
Department: EM&C  
Phone: 849-2659  
Dispatcher: Glenn Taylor  
Spill date: 09-21-2011  
Spill time: 0800  
Spill address:  
Pole or vault #:  
or substation: WILLBRIDGE  
Whose property is involved?  
Type of Discharge: Oil  
PCB content known by sticker color: Blue < 1  
Hazardous Material? No  
Estimated quantity of spill (gallons): 1  
Type:  
Estimated area of spill (sq ft): 8  
Material or surface contaminated: GRAVEL/CONCRETE  
Type of water oil spilled into:  
Equipment description:  
Company NO.: 10595  
KVA Size: 12/16/20  
Serial NO.: WK1  
Is there a fire? No  
Weather Conditions: Dry  
Comments  
Vehicle hit pole / pad? No  
Is EM&C handling the spill cleanup? Yes  
If not, who will be doing the cleanup?  
Comments

### Notifications (When Required)

Environmental services	Time
Substations	Time
Inside Hydroelectric Projects	Time
Electrical Equipment	Time
PHP 1 AND PHP 2	Time
Other	Time

# PORTLAND GENERAL ELECTRIC OIL SPILL REPORT (Form 1058)

For recording the details associated with fuel and oil spill reporting  
and for documenting the cleanup activities.

## SECTION I - REPORT THE FOLLOWING SPILL INFORMATION TO SYSTEM LOAD DISPATCHER (464-8343)

DATE 9/21/11	TIME 900	REPORTED BY JERRY THOMAS	<input type="checkbox"/> AREA SECURED and SPILL CONTAINED
DEPARTMENT EM&C		DISPATCHER GLENN TAYLOR	
SPILL ADDRESS WILLBRIDGE SUBSTATION (PORTLAND)			
CAUSE OF SPILL <input type="checkbox"/> Weather / Tree Fall <input type="checkbox"/> Vehicle Hit Pole / Pad <input checked="" type="checkbox"/> Equipment Malfunction		ID OF PERSON AT FAULT (if not PGE responsibility)	
WHOSE PROPERTY IS INVOLVED? <input type="checkbox"/> Public <input type="checkbox"/> Private <input checked="" type="checkbox"/> PGE		TYPE OF PGE PROPERTY INVOLVED? <input type="checkbox"/> Vault <input checked="" type="checkbox"/> Substation <input type="checkbox"/> Other ( )	
POLE, VAULT or SUBSTATION #			
TYPE OF DISCHARGE <input type="checkbox"/> Oil / Hydraulic Fluid <input type="checkbox"/> Fuel <input checked="" type="checkbox"/> Oil with potential PCB content <input type="checkbox"/> Other ( )			
PCB CONTENT KNOWN BY STICKER <input checked="" type="checkbox"/> <1 (blue) <input type="checkbox"/> <15 (red) <input type="checkbox"/> <48 (black) <input type="checkbox"/> Non-PCB (green) <input type="checkbox"/> No Sticker			
PCB OIL SAMPLE COLLECTED? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes		SAMPLE COLLECTED BY? N/A	LAB ANALYSIS RESULTS (PCB) <1
ESTIMATED QUANTITY OF SPILL IN GALLONS 1		ESTIMATED AREA OF SPILL IN SQUARE FEET 8	
MATERIAL OR SURFACE CONTAMINATED (check all that apply) <input type="checkbox"/> Water <input checked="" type="checkbox"/> Soil / Gravel <input checked="" type="checkbox"/> Asphalt / Concrete <input type="checkbox"/> Vegetation <input type="checkbox"/> Bottomless Vault <input type="checkbox"/> Other ( )			
TYPE OF WATER OIL SPILLED INTO (check all that apply) <input type="checkbox"/> Ditch <input type="checkbox"/> Storm Drain / Sewer <input type="checkbox"/> Stream / River <input type="checkbox"/> Lake			
EQUIPMENT DESCRIPTION <input checked="" type="checkbox"/> Transformer <input type="checkbox"/> Capacitor <input type="checkbox"/> Other ( )		MORE THAN ONE PIECE OF LEAKING EQUIPMENT INVOLVED? <input type="checkbox"/> Yes How many?	
SERIAL # (S)	KVA SIZE (S) 20 MVA	COMPANY NO. (S) WK 1 10595	
IS THERE A FIRE? <input checked="" type="checkbox"/> No <input type="checkbox"/> Yes		WEATHER CONDITIONS: <input checked="" type="checkbox"/> Dry <input type="checkbox"/> Wet	
COMPLETED BY JERRY THOMAS		PHONE 849-2659	

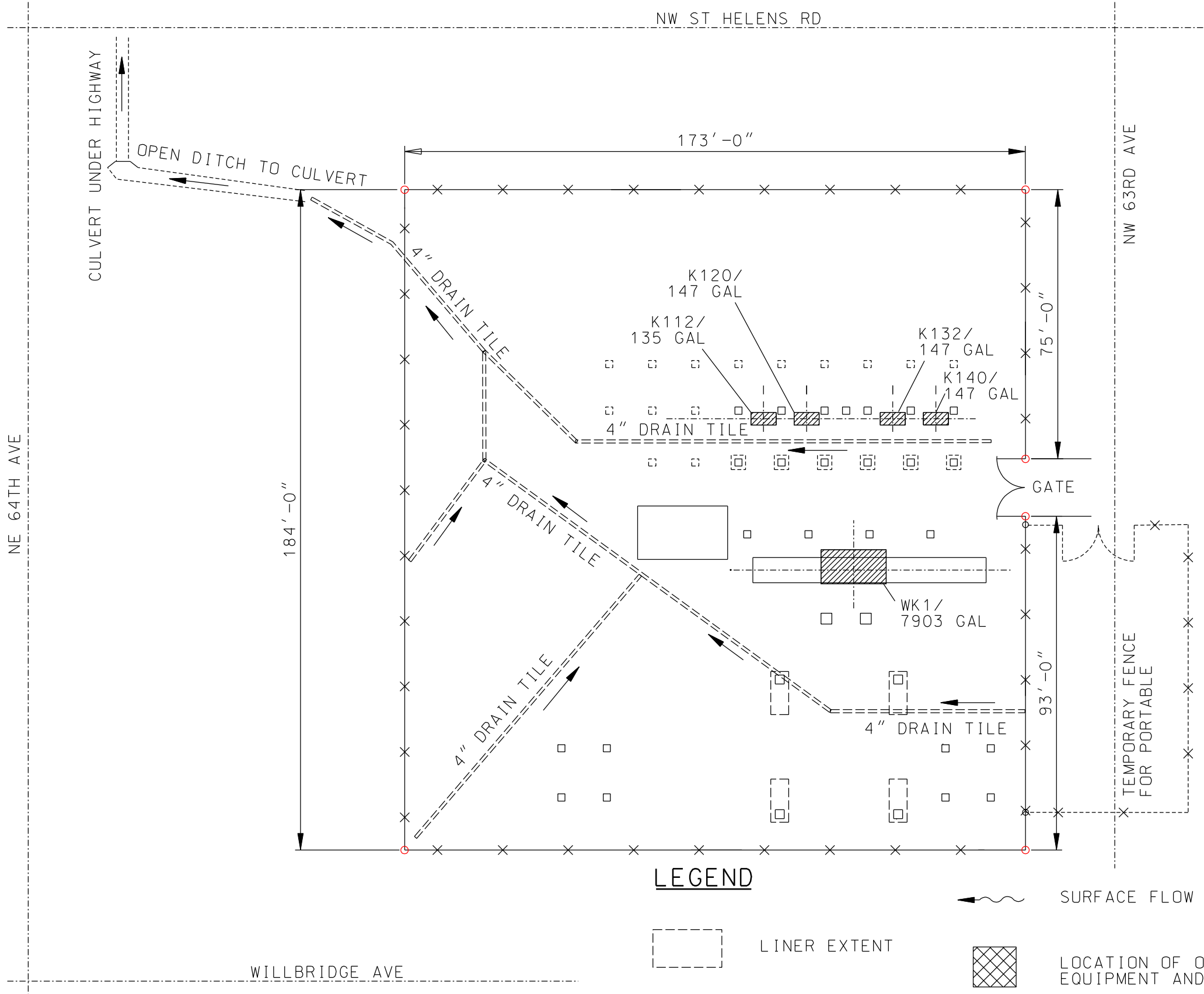
## SECTION II - DOCUMENT THE SPILL WAS CLEANED UP

CLEANUP TRANSFERRED TO EM&C SPILL RESPONSE

☒ Yes ☐ No

DATE CLEANUP STARTED 9/21/11	TIME 8AM	BY EM&C
CLEANUP MATERIAL (check all that apply) <input type="checkbox"/> Water <input type="checkbox"/> Soil <input type="checkbox"/> Asphalt <input type="checkbox"/> Vegetation <input checked="" type="checkbox"/> Concrete <input checked="" type="checkbox"/> Other (GRAVEL)		
METHOD (check all that apply) <input checked="" type="checkbox"/> Soil Removal <input checked="" type="checkbox"/> Surface Washing <input type="checkbox"/> Pumping <input type="checkbox"/> Other ( )		
WHEN SOIL REMOVAL: DEPTH (INCHES) 3	VOLUME OF SOIL (CUBIC FEET) 2	VOLUME OF WATER RECOVERED (GALLONS)
PLACE CONTAMINATED EQUIPMENT AND MATERIALS IN PROPERLY DATED AND LABELED CONTAINERS AND VERIFY COMPLETION OF "REPORT FOR TRANSPORTING ELECTRICAL EQUIPMENT AND MATERIAL" (PGE FORM 0080) BY WRITING THE SEQUENTIAL NUMBER FROM TOP OF THE FORM HERE: FORM 0080, NO. IMMEDIATELY TRANSPORT CONTAINERS TO PSC, OR APPROPRIATE TEMPORARY STORAGE AREA.		
DATE CLEANUP COMPLETED 9/21/11	(IF DELAYED, EXPLAIN BELOW) ONGOING UNTIL REPAIRED	
THE CLEANUP REQUIREMENTS HAVE BEEN MET AND INFORMATION IN THIS REPORT IS TRUE TO THE BEST OF MY KNOWLEDGE.		
Signed: <u>Jerry Thomas</u> (Foreman/Spill Coordinator)		Date: 9/21/11

Keep original at facility or send to EM&C Spill Response; Copy to Environmental Services



REFERENCES

- C-12202 GENERAL LAYOUT
- C-12221 GROUNDING PLAN
- C-20735 CONDUIT PLAN
- C-28685 FENCE AND FOUNDATION LOCATION PLAN


LEGEND

- LINER EXTENT
- PIPING
- FLOW

- SURFACE FLOW
- LOCATION OF OIL CONTAINING EQUIPMENT AND VOLUMES OF OIL
- LOCATION OF OIL SPILL RESPONSE KIT
- DRAIN TILE



SCALE: 1" = 30'

INDEX NO. <b>WLBR - SPCC</b>		<b><u>WILLBRIDGE SUBSTATION</u></b>			REV.	DATE	REVISION DESCRIPTION	DRAWN	ENGR.	APPD.
SHEET 1 OF 1										
DISTR. CODE D-SPCC										
		<b>FACILITY DIAGRAM</b>			0	/ /	ORIGINAL ISSUE.			
						/ /				

# Technical Memorandum



To: Portland General Electric (PGE)  
From: Susan Garland, URS  
Date: December 6, 2011  
Subject: Willbridge Substation Stormwater Drainage Assessment

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## 1.0 BACKGROUND AND OBJECTIVES

URS conducted a stormwater assessment on behalf of PGE to investigate potential stormwater flow pathways from Willbridge Substation to the Willamette River. The Willbridge Substation is located at 6315 NW St. Helens Road in Portland, OR (Figure 1). The substation occupies two tax lots, and PGE also owns twelve adjoining tax lots that are currently undeveloped. Willbridge Substation is located at the base of a steep, vegetated hillside and the substation ground surface slopes moderately toward St. Helens Road to the southeast. Willbridge Substation is located approximately 2,500 feet from the Willamette River.

Susan Garland (URS) and Brandy Domina (PGE) conducted a preliminary site visit on September 8<sup>th</sup>, and conducted the stormwater drainage assessment during a rain event on November 16, 2011. The stormwater assessment included the following objectives:

1. Determine any off-site points of discharge for site stormwater.
2. Identify any discrepancies between current site conditions and previous drainage maps for the site.

## 2.0 METHODOLOGY

Existing site conditions were observed on November 16, 2011, while it was raining. Portland received 0.49 inches of rain in the 24 hours preceding the site visit<sup>1</sup>. URS observed the following elements of the existing conditions:

- Topography and slope of the site and its vicinity.
- Location, type, and amount of vegetation cover on or adjacent to the site.
- Surface soil texture on and adjacent to the site.
- Location and flow paths of stormwater runoff.
- Location of constructed stormwater conveyance features such as sumps, culverts, catch basins, pipes, and ditches, both on and off site.
- Evidence of soil erosion and transport such as rills, sediment deposits, sediment staining on vegetation, drift lines, etc.

Relevant observations and site features were photographed and recorded on a map of the site. URS also reviewed PGE site plans documenting the conditions of the site, including details regarding stormwater management and spill containment systems.

## 3.0 ASSESSMENT OF STORMWATER DRAINAGE

Following the text of this memorandum, Figure 1 depicts observations of the existing site conditions and

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<sup>1</sup> National Weather Service, Portland Oregon website accessed on November 23, 2011 from:  
<http://www.weather.gov/climate/index.php?wfo=pqr>

includes a photo location key. Appendix A includes relevant site photographs.

As shown in Figure 1, the Willbridge Substation occupies a graveled area at the foot of a steep, vegetated hillside, located on the west side of NW St. Helens Road. City and County maps depict a public right-of-way, Willbridge Avenue, adjoining the substation on its uphill, northwest side, but this right of way is not graded or cleared of trees.

The Willbridge parcel general slopes northeast toward St. Helens Road, but the ground surface is irregular, and the north end of the property has both gullies and elevated areas consisting of gravel piles. Photo 6 in Appendix A shows surface soil cracks that are indicative of surface ponding. As depicted on Figure 1, several prominent gullies cross the site, indicating lateral surface flow across the substation. During the November 16 rain event, surface ponding occurred in several areas at the south end of the site, most prominently in the southeast corner. Hillslope drainage enters the substation site from two locations, adding stormwater volume and channelizing flow conditions.

On the southwest edge of the substation, a small gully on the adjacent hillside defines a surface water flow path that continues onto the substation through a low spot under the substation fence (Photo 1). From here, the shallow gully continues across the substation to a low spot (Photo 11) along the northeast edge of the substation property, where it enters an ODOT storm ditch (Photo 9) between the substation and St. Helens Road. During the November 16<sup>th</sup> site visit, small amounts of water were discharging from this point into the ditch, but there was no surface water flowing onto the substation from the hillslope.

Along the northwest edge of the substation a small gully on the adjacent hillside defines a surface water flow path (Photo 3). The flow path continues through an eight-inch-diameter concrete pipe under the substation fence and onto the substation (Photos 3 and 4). The flow path continues northeast as a prominent gully to the northeast corner of the substation where an eight-inch-diameter concrete pipe (Photo 7) connects the flow path to the ditch between the substation and St. Helens Road. Sediment deposits immediately upslope of the pipe (Photo 6) indicate that some ponding of water and sediment deposition occurs before the water discharges through the pipe to the ditch. Ponding occurs because the pipe invert elevation is higher than the ponding area, and the pipe is partially filled with soil and gravel which further increases the effective invert elevation of the pipe. However, sediment-coated gravel within the pipe and at its outlet to the ditch (Photo 7) indicates that sediment is also transported to the ditch. During the November 16<sup>th</sup> site visit, no water was discharging from this pipe and there was no surface water flowing onto the substation from the hillslope gully.

In addition to the two discharges to the road-side ditch described above, a third point of discharge from the substation to the adjoining ditch (Photo 8) is located near the substation's southeast corner. The area did not have the prominent gullies or sediment deposits noted along the other flow paths described above, and hillslope run-off does not appear to contribute to this discharge point. No discharge was flowing from this point during the November 16<sup>th</sup> site visit.

Surface water discharging from the substation enters the ditch located between the substation and St. Helens Road. This ditch also receives run-off from the roadway (Photo 10). From there the stormwater enters a catch basin (Photo 9). ODOT and City of Portland Maps indicate that the catch basin conveys stormwater under St. Helens Road near 63<sup>rd</sup> Avenue to a ditch on the east side of the road that in turn drains to North Doane Lake. North Doane Lake discharges to the Willamette River through City of Portland's outfall 22C.

A 1985 drainage plan of the substation provided by PGE shows subsurface tile drains under the substation that discharge to a roadside ditch, which is depicted to continue northwest to a culvert under St. Helens Road. No roadside ditch is currently located at the location depicted. The presence of tile drains could not be confirmed during the site visit. Specifically, tile drain outfalls were not observed,

and the ditch is located along the northeast substation fenceline and discharges to the catch basin described above rather than a culvert under St. Helens Road.

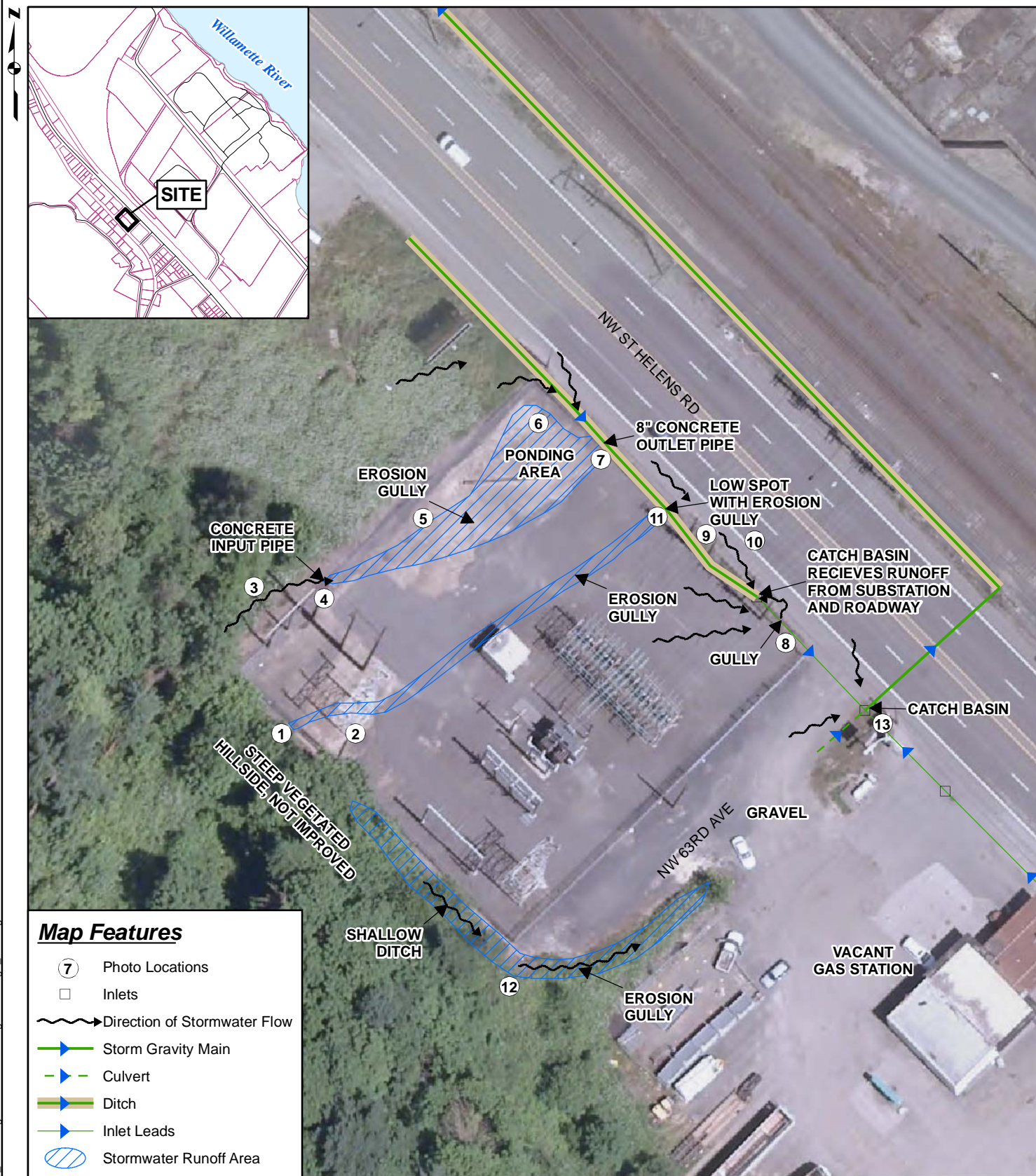
On the southwest side of the substation, a shallow ditch (Photo 12) is located uphill of the substation and diverts hillside run-off around the substation and onto the gravel right-of-way of NW 63<sup>rd</sup> Avenue. Runoff from the substation does not commingle with this hillslope runoff.

## 4.0 CONCLUSIONS

The site visits, together with the review of a site plan indicates the stormwater drainage at the Willbridge Substation includes the following components:

- 1) Gullies indicate that hillslope run-off flows onto the substation at two locations.
- 2) Stormwater runoff from the substation discharges to the roadside ditch at three locations.
- 3) At two of the three discharge locations substation stormwater has the potential to commingle with hillslope runoff when the hillslope runoff is discharging onto the substation. Gullies and sediment deposits indicate that later during the wet season when hillslope soils are wetter or during heavy rain events any time of year, the volume of hillslope runoff is likely much greater than the substation runoff.
- 4) From the ditch, runoff from the hillslope, substation, and NW St. Helens Road enters a catch basin leading to a ditch on the east side of NW St. Helens Road.
- 5) The east side ditch discharges to North Doane Lake. Although the lake discharges to the Willamette River at City of Portland Outfall 22C, the lake likely functions as a sink for sediment entrained in stormwater and reduces the actual mass of sediment that reaches the river.





Source: USGS 2008  
City of Portland BES 2008.

25 0 25 50  
Feet

**URS**

## WILLBRIDGE SUBSTATION DRAINAGE

DECEMBER 2011  
25697439

PGE  
WILLBRIDGE SUBSTATION  
PORTLAND, OREGON

**FIGURE 1**

APPENDIX A  
Photo Log





## Appendix A: Photographic Log

**Client Name:**

Portland General Electric

**Site Location:**

Willbridge Substation

**Project No.**

25697439

**Photo No.**

1

**Date:**

09-08-11

**Direction Photo  
Taken:****Description:**

Low spot in uphill  
substation boundary  
where stormwater  
drainage is entering from  
the hillside.

**Photo No.**

2

**Date:**

09-08-11

**Direction Photo  
Taken:**

West

**Description:**

Erosion gully showing that  
hillside drainage is  
entering substation from  
the adjoining hillside







## Appendix A: Photographic Log

**Client Name:**

Portland General Electric

**Site Location:**

Willbridge Substation

**Project No.**

25697439

**Photo No.**

3

**Date:**

09-08-11

**Direction Photo  
Taken:**

West

**Description:**

Looking uphill from the northwest substation fenceline, a gully showing that drainage from the northwest of the substation is entering the property through a concrete inlet pipe.

**Photo No.**

4

**Date:****Direction Photo  
Taken:**

North

**Description:**

From inside of the substation fence, the concrete pipe bringing drainage in from the hillside.







## Appendix A: Photographic Log

**Client Name:**

Portland General Electric

**Site Location:**

Willbridge Substation

**Project No.**

25697439

**Photo No.**

5

**Date:**

09-08-11

**Direction Photo  
Taken:**

East

**Description:**

Looking downhill from the inlet pipe, a prominent erosion gully leading toward NW St. Helens Road

**Photo No.**

6

**Date:**

09-08-11

**Direction Photo  
Taken:**

Southwest

**Description:**

Silt deposits and drying cracks on the ground surface in the foreground show evidence of ponding in the north corner of the substation







## Appendix A: Photographic Log

**Client Name:**

Portland General Electric

**Site Location:**

Willbridge Substation

**Project No.**

25697439

**Photo No.**      **Date:**  
7

**Direction Photo Taken:**

East

**Description:**

Outlet pipe at base of ponding area leading to a roadside ditch, and showing evidence of entrained gravel and sediment transport.



**Photo No.**      **Date:**  
8      11-16-11

**Direction Photo Taken:**

North

**Description:**

Low spot at east end of substation with evidence of surface erosion into the ditch along St. Helens Road.







## Appendix A: Photographic Log

**Client Name:**

Portland General Electric

**Site Location:**

Willbridge Substation

**Project No.**

25697439

**Photo No.** 9      **Date:** 09-08-11

**Direction Photo Taken:**

Northwest

**Description:**

Ditch and catch basin located between Willbridge Substation and NW St. Helens Road.



**Photo No.** 10      **Date:** 11-16-11

**Direction Photo Taken:**

East

**Description:**

Ditch and catch basin receiving stormwater from St. Helens Road during November rain event.







## Appendix A: Photographic Log

**Client Name:**

Portland General Electric

**Site Location:**

Willbridge Substation

**Project No.**

25697439

**Photo No.**      **Date:**  
11                  11-16-11

**Direction Photo  
Taken:**

Southwest

**Description:**

Surface outlet of central  
erosion gully under fence  
and into roadside ditch.



**Photo No.**      **Date:**  
12                  09-08-11

**Direction Photo  
Taken:**

West

**Description:**

The south section of the  
hillside above the  
substation is diverted in a  
shallow ditch and flows  
onto the gravel right-of-  
way of 63<sup>rd</sup> Avenue.





## Appendix A: Photographic Log

**Client Name:**

Portland General Electric

**Site Location:**

Willbridge Substation

**Project No.**

25697439

**Photo No.**      **Date:**  
13              11-16-11

**Direction Photo  
Taken:**

Southeast

**Description:**

A catch basin east of the Substation receives the remaining runoff from NW St. Helens road and the runoff from NW 63<sup>rd</sup>.

